



Thermodynamics

MCQ March 11th 2022

- 0 0 0 0 0 0 0
- 1 1 1 1 1 1 1 1
- 2 2 2 2 2 2 2 2
- 3 3 3 3 3 3 3 3
- 4 4 4 4 4 4 4 4
- 5 5 5 5 5 5 5 5
- 6 6 6 6 6 6 6 6
- 7 7 7 7 7 7 7 7
- 8 8 8 8 8 8 8 8
- 9 9 9 9 9 9 9 9

← Please enter you student number, and write your name above.

NAME, First Name :
 HIDEUX LelaHEL

Duration : 30 minutes - No document allowed and all calculators authorised - No wifi no 4/5G

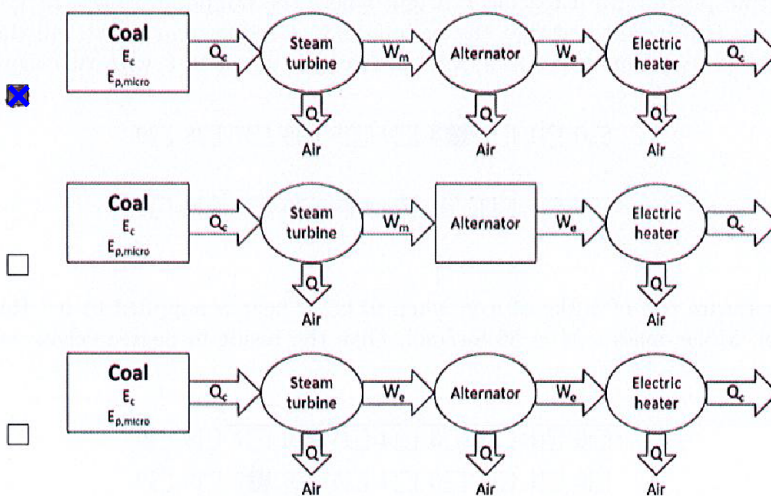
Q1 In order to cook some pasta, you need to let the water in the pot boil. Considering that the system is composed by the pot with the water and defining Q the heat exchanged between the system and the surroundings, which of the following sentences is correct ?

1/1

- $Q = 0$
- $Q < 0$
- $Q > 0$

Q2 Which energy chain showing the functioning of an electric heater from a coal power plant is correct ?

1/1



Q3 A closed chamber of volume 8L at a temperature of 293K contains 10 moles of an ideal gas mixture of O_2 , N_2 et H_2O . Knowing that the partial pressures of O_2 , N_2 are respectively 8 and 7 bar, how many moles of water are present in the chamber ? The gas constant R is 8.31 J/K/mol. Give the result in moles with three significant digits.

1/1

- 0 1 2 3 4 5 6 7 8 9
- 0 1 2 3 4 5 6 7 8 9
- 0 1 2 3 4 5 6 7 8 9

Q4 Which of the following energie(s) is (are) a type of primary source ?

1/1

- Hydraulic energy
- Wind energy
- Geothermal energy
- Electric energy



Q5 A wind power plant of 2.0 MW can usually produce electrical energy for only seven hours per day on average. How much energy (expressed in GWh with one significant digit) is produced in one year?

1/1

0 1 2 3 4 5 6 7 8 9

Q6 Which of the following statement(s) is (are) correct?

0.999/0.999

- Sublimation requires energy to be provided. Solidification requires energy to be removed.
 Evaporation requires energy to be provided.

Q7 The KERS (Kinetic Energy Recovery System) allows the recovery of kinetic energy to feed the battery in Formula 1 cars. Knowing that its efficiency is 0.65, how much energy is recovered in the battery from the deceleration of a car of 700 kg from a speed of 260 km/h to 60 km/h? Give the result in MJ with two significant digits.

1/1

0 1 2 3 4 5 6 7 8 9

0 1 2 3 4 5 6 7 8 9

Q8 At equilibrium, the partial pressure of water can be (several possible answers) :

0.999/0.999

- lower than its vapor pressure. larger than its vapor pressure.
 equal to its vapor pressure.

Q9 A kid on the earth surface ($T = 25^\circ\text{C}$, $P = 1$ bar) fills its balloon of 4 L with air and then he let it rise in the atmosphere until it reaches a height where the temperature is -18°C . Supposing that the atmospheric pressure is constant and that the balloon is a closed system, what will the balloon volume be at this height? The gas constant R is 8.31 J/K/mol. Give the result in L with two significant digits.

1/1

0 1 2 3 4 5 6 7 8 9

0 1 2 3 4 5 6 7 8 9

Q10

What is the temperature rise of 3.2 kg of iron when 97 kJ of heat is supplied to it? Heat capacity of iron : $C = 25.1$ J/K/mol. Molar mass : $M = 55.8$ g/mol. Give the result in degree celsius with three significant digits.

1/1

0 1 2 3 4 5 6 7 8 9

0 1 2 3 4 5 6 7 8 9

0 1 2 3 4 5 6 7 8 9